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Subject: SARAL/AltiKa first verification workshop : main conclusions
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1 Attachment, 216 KB

Dear all,

Please find hereafter the main conclusions of the first SARAL Verification Workshop, which has been held on August 27-28-29th in Toulouse.

Synthesis
The performances of the payload instruments and the quality of the results has to be underlined, especially just a few months after the launch.
OGDR and IGDR products have been distributed to all Users from June 25th; GDR products are available to PIs since August 2nd.
Some algorithms are still to be tuned: neural network used for radiometer data ground processing, Sea State Bias computation, altimeter wind speed and ICE2 retracking.
According to users presentations, the main message of this meeting is the easiness to use the data (thanks to the ground segment operationnality and the expertise of the users). The level of quality achieved by the products in terms of accuracy, data latency and availability is such that the SARAL/AltiKa data are now operationnaly integrated in several forecast systems (in Europe : CNES SALP, Météo France, Mercator, ECMWF, in India : ISRO/INCOIS, in Australia : CSIRO, in USA : NOAA, Navy).
The catchword for the SARAL/AltiKa data could be "ready to use".

Disclaimers and foreseen evolutions
The objectives of the current version (patch 1 applied) are recalled.The disclaimers can be found in the User Handbook.

The GDR in V1are delivered to the PI since August 2nd, and their good quality has already been assessed.
As a consequence, **it has been decided to deliver the GDR_T ("T" for test) to all users (via AVISO ftp server) in the current version by September**.

Then the foreseen products evolutions V2 have been detailed by the project, and the level of priority has been discussed with the PIs.
The V2 will be prepared by end 2013, to be available early 2014 and evaluated in frame of the second verification workshop (foreseen in April 2014).

- Geophysical updates :

  - wind/sea state bias : it has been proposed to implement the 1-parameter algorithm (based on the attenuated sigma0) suggested by R. Scharroo and J. Lillibridge. For that purpose, the atmospheric attenuation will be improved. --> high priority
  - matching pursuit algorithm : the updated solution presented during the meeting has to be

implemented. For the rain flagging, the method presented by G. Quartly could be documented in the User Handbook (TBC). --> medium priority

- the neural network for the radiometric correction : the new data base (DBA2012, 3 parameters) has to be implemented. Thus the Liquid Water Content will be improved but not yet perfect. --> high priority
- coastal radiometric correction based on the Envisat method : the land pollution occurs at about only 6 km from the coast, and the Envisat method is not perfect --> low priority
- ice2 retracking : an updated solution has to be implemented to take into account the Ka-band characteristics (on-going analysis at LEGOS) --> high priority
- ice1 and sea ice retrackings : further analysis are needed.
- TRIODE : improvement of the ground processing of the on-board DIODE orbit estimation. the Doris team has to check if it is feasible in the V2 --> medium priority
- FES2012 : this new tidal model is available on the AVISO website but not yet included in the L2 products --> high priority
- surface flag based on GlobCover : the background is that it would be only a nadir point (and not the closest point) --> low priority
- distance to the coast : it will be also a distance taking into account the nadir point --> medium priority

- Review of the configuration files to explain the range bias (about 6cm) --> it will be checked in the coming weeks --> high priority
- Instrument processing updates (no impact on the L2 products) --> when feasible
- Product updates :
  - MQE scale factor --> low priority
  - to update the maneuver flag : it seems to be too early, more data have to be analyzed.
  - to identify new parameters : new relevant parameters can be proposed by the scientist.
  - to change the version product from "T" to "D" : Postponned after next Verification Workshop foreseen in April 2014.
  - to account for the AGC in the waveforms recorded in the L2 products : it is not recommended because users should have to uncorrect from AGC before applying a retracking (which is not so easy). It would be better to explain in the User handbook how to apply the AGC correction in order to visualize the "real" waveforms (without the gain control). --> Project shall make effort to generate a S-GDR User Handbook.

Some other updates for later implementation (V3) are listed for memory, and will be analyzed in the coming months.
PIs are encouraged to analyze this proposal from the project and to provide advices.

AVISO newsletter
The project intends to publish a dedicated SARAL newsletter. For that purpose, some results presented during the meeting will be used.
Moreover, the agreement of the PIs will be asked before the publication of their interviews.

Conclusion by P. Sengenes
It was a very fruitful meeting, the quality of the results which have been presented demonstrates the performance and the easiness to use the SARAL/AltiKa data only a few months after the launch.
Regarding the orbit inclination (which is not yet exactly the same as Envisat), discussions will be conducted with ISRO in order to correct it.

Jacques Verron Conclusion
The SARAL/AltiKa results seem to be excellent, at the same level as the Jason reference mission ones, even sometimes better.

It has to be emphasized how the data are easy to use and to integrate in operationnal systems. Warmest congratulations to the mission project.
The SARAL/AltiKa mission will be in the scope of the OSTST in Boulder with several presentations expected, including a keynote talk. However, it could be relevant to keep in mind the specificities of the SARAL/AltiKa mission (among them the use for the first time of an altimeter in Ka-band) with respect to the OSTST (more dedicated to the ocean).
It could be relevant to hold the next SARAL verification workshop around April 2014, possibly in India, mainly aiming at reviewing and assessing the quality of GDR data and discussing first scientific results.
The 2014 OSTST will be in Germany and it is planned to have a joint dedicated SARAL/AltiKa symposium.
A call for contributions to a special scientific journal issue on SARAL/AltiKa will be proposed in the middle of 2014.

Best regards.

On behalf of the CNES SARAL project team,

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ALTIKA LEVEL2 PRODUCTS PROCESSING EVOLUTIONS

CNES and CLS team

Content

1. Current Version : Patch 1
2. Update of the current processing baseline
    1. V2 to be implemented by end 2013 – TBC
    2. V3 by end 2014 – TBC

Current processing baseline
V1

Patch 1 :

- **Patch 1 was developed and implemented to**
  - **correct some anomalies**
  - **and implement some evolutions.**
  - **Refer to the SALP presentation for more details on the context of this patch**
  - **We remind that there is obviously still some disclaimers – mainly due to Ka band. All disclaimers are recorded in the SARAL User Handbook**

- **Products are already very good for most of the applications:**
  - **a few evolutions are however possible to improve the data quality. This shall not impact the current operational use of SARAL data by ocean models – PEACHI could be a suitable prototype to assess algorithms before operational implementation if required (sea-ice, inland water, …)**

  - **We propose to disseminate to all users the GDR_T products in V1.**

Update of the current processing baseline : V2

Another version will be prepared by end 2013. This version shall be available by early 2014 to support the calVal meting foreseen in April 2014. In this version we could implement (perimeter to be assessed further in front of the impact on the ground segment):

- **Geophysical evolutions updates :**

  - **Wind look up table based on the proposal from J. Lillibridge and R. Scharroo.**
    The 1D model could be the best candidate.

  - **SSB look up table based on the proposal from J. Lillibridge and R. Scharroo**
    The 1D model could be the best candidate. More flight data is required to better account for the Ka band Sigma0. A 2D model based on SWH and sigma0 (and not the wind …) could also be envisaged. The ground processing algorithms could be adapted to account for this.

  - **Matching Pursuit algorithm (remove the data over land, sea ice, update the tuning parameters, ..) based on the proposal from J. Tournadre and CLS**
    CLS approach could be the best candidate. For rain flagginf, the proposal from Graham has to be analysed, it should be at least documented in the User Handbook.

  - **Radiometer neural algorithm (2012 data base) based on the proposal from CLS.**
    We need to verify the problems of resolution on sigma0 and atmospheric corrections.

  - **Coastal radiometer correction based on the method used on ENVISAT mission**
    Based on the presentation from M.L.D.

Update of the current processing baseline : V2

Another version will be prepared by end 2013 (schedule to be precized once the perimeter will be defined) to account for:

- **Geophysical evolutions updates :**
  - **Ice2 retracking algorithm to comply with Ka band based on the proposal from LEGOS and CLS.**
    Based on the presentation from CLS and LEGOS, depending on the data quality analysis on going on LEGOS side.
  - **Ice1 and Sealce retracking algorithm outputs require additional validation and analysis.**
  - **Upgrade Triode to reduce the periodic signal observed on the altitude differences with MOE/POE**
    Based on the presentation from C.J.
  - **Implement FES 2012**
  - **Implement a surface flag based on GlobCover**
  - **Implement the distance to the closest coast information (and to the closest land …)**
- **Review the configuration files in order to explain the range bias observed (about 6 cms)**

Update of the current processing baseline : V2

Another version will be prepared by end 2013 (schedule to be precized once the perimeter will be defined) to account for:

- **Instrument processing updates :**
  - **Implement the processing of the altimeter I&Q calibrations**
  - **Update the altimeter characterization file to account for 63 values (currently limited to 62).**
  - **Modify the altimeter calibration algorithm – the PTR shall not be corrected by the LPF.**
- **Product updates :**
  - **Update the MQE parameter scale factor (currently 10^{-4})**
  - **Update the manoeuver flag in the OGDRs products like what was performed on Jason-2**
  - **Review the SARAL product spec to identify potential new parameters like**
    - **distance to the coast,**
    - **GlobCover surface flag**
  - **Modify the product version from 'T' to 'D' ??**
  - **Account for the AGC control loop in the waveforms recorded in L2 products to ease understanding and analysis over all surfaces**

Update of the current processing baseline V3 – end 2014 TBC / TBD

Another version could be prepared by end 2014 to account for:

- **Ongoing studies as part of the PEACHI prototype :**
  - **Sea ice flag**
  - **Land ice flag**
  - **Wind speed look up tables based on collocation with scatterometers values**
  - **New approach to compute the wet tropospheric correction accounting for the SST and the profile**
  - **SSB look-up table with one year of Ka band flight data and wind speed derived from SIgma0_Ka**
  - **Waveforms classification flag**
  - **Coastal wet tropospheric correction based on a method used on Jason-2 mission**
- **Update the radiometer neural algorithm**
- **Implement FES 2012 (if not already done in V2) and/or FES2014**
- **Implement a surface flag based on GlobCover (if not already done in V2)**
- **Implement the distance to the closest coast information (if not already done in V2)**
- **Implement a manoeuver flag in the offline products**

Update of the current processing baseline V3 – end 2014 TBC / TBD

Another version could be prepared by end 2014 to account for:

- **Upgrade the sea-ice processing (TBC)**
- **Align the algorithm applied on ground on the 2 tracking values (no impacts for users – only used to monitor the quality of the MNT tracking mode)**